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PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional) 1052-0199	
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on 18 April 2007 Signature [signature] Typed or printed name Laura H. Andre	Application Number 10/784,836		Filed 02/23/2004
	First Named Inventor Richard A. Johnson		
	Art Unit 2618		Examiner LE, Lana N.

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☑ attorney or agent of record.
Registration number 42,808

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 ____________

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April 18, 2007
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of ________ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Richard A. Johnson		
Title:	Tuner for Radio Frequency Receivers and Associated Method		
App. No.:	10/784,838	Filed:	02/23/2004
Examiner:	LE, Lana N.	Group Art Unit:	2618
Atty. Dkt No.:	1052-0199 (SILA:199)	Confirmation No.:	1480

M/S AF
Commissioner for Patents
P.O. Box 1450
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REMARKS IN SUPPORT OF PRE-APPEAL BRIEF REQUEST FOR REVIEW

Dear Sir:

In reply to the Advisory Action (mailed March 12, 2007) and the Final Office Action (mailed January 4, 2007), Applicant has concurrently filed herewith a Notice of Appeal and a Pre-Appeal Brief Request for Review and a Request for a one-month extension of time, extending the time for Reply until May 4, 2007. Applicant concisely presents in the REMARKS section below reasons why the application is not in condition for Appeal and why the rejection of the claims is improper. For convenience, Applicant has submitted herewith a Claim Listing of the claims as they currently stand.

Claim Listing begins on page 2.

Remarks begin on page 8.

CLAIM LISTING:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously presented) A tuner comprising:

   a direct digital frequency synthesizer having an output terminal for providing a digital local oscillator signal having a frequency chosen to mix a channel to a desired frequency; and

   a mixer having a first input terminal for receiving a radio frequency signal, a second input terminal coupled to the output terminal of the direct digital frequency synthesizer, and an output terminal for providing an analog output signal at a desired frequency.

2. (Original) The tuner of claim 1, wherein the desired frequency of the output signal is at baseband.

3. (Original) The tuner of claim 1, wherein the radio frequency signal comprises a plurality of channels and wherein the desired frequency of the output signal is less than or equal to three channel widths.

4. (Original) The tuner of claim 1, wherein the radio frequency signal comprises a plurality of channels and wherein the desired frequency of the output signal is greater than three channel widths.

5. (Original) The tuner of claim 4, wherein the radio frequency signal represents a radio band signal.

6. (Original) The tuner of claim 5, wherein the radio band signal is an FM radio signal.

7. (Original) The tuner of claim 1, wherein the direct digital frequency synthesizer and the mixer are combined in a single integrated circuit.

8. (Original) The tuner of claim 1, wherein the mixer comprises: a transconductance amplifier having an input terminal for receiving the radio frequency signal, and an output terminal

for providing at least one current signal; and a mixing digital-to-analog converter having a first input terminal coupled to the output terminal of the transconductance amplifier, a second input terminal coupled to the output terminal of the direct digital frequency synthesizer, and an output terminal for providing the output signal at the desired frequency.

9. (Original) The tuner of claim 8, wherein the radio frequency signal, the current signal, and the output signal comprise differential signals.

10. (Original) The tuner of claim 8, wherein the transconductance amplifier comprises a plurality of current cells.

11. (Original) The tuner of claim 10, wherein the plurality of current cells is characterized as being binarily weighted.

12. (Original) The tuner of claim 10, wherein the plurality of current cells include a first plurality of current cells characterized as being binarily weighted and a second plurality of current cells characterized as being equally weighted.

13. (Original) The tuner of claim 1, wherein the direct digital frequency synthesizer further comprises an input terminal for receiving a tuning signal corresponding to a desired channel and is configured to provide the digital local oscillator signal at a frequency determined at least in part by the tuning signal.

14. (Original) The tuner of claim 10, wherein each cell comprises: a current source having first and second terminals, the current source having a size proportional to an order of the cell and generating an output current proportional to a voltage applied at the second terminal; a modulation circuit configured to modulate a voltage at the first terminal of the current source in response to a received voltage signal; and a selection circuit configured to selectively divert the output current between the first output terminal and a second output terminal in response to a bit of a digital local oscillator signal having an order corresponding to an order of the cell.

15. (Original) The tuner of claim 14, wherein the first output terminal comprises a single-ended

output signal and the second output terminal comprises a reference voltage terminal.

16. (Original) The tuner of claim 14, wherein the first and second output terminals together form a differential output signal of the mixer.

17. (Original) The tuner of claim 14, further comprising:

a second current source having first and second terminals, the second current source having a size proportional to the order of the cell and generating an output current proportional to a voltage applied at the second terminal;

means for modulating a voltage at the first terminal of the second current source in response to a second received voltage signal; and

means for selectively diverting current between the second output terminal and the first output terminal respectively in response to the bit and a complement of the bit.

18. (Original) The tuner of claim 7, further comprising at least one additional receive path on the single integrated circuit, the additional receive path comprising:

a second direct digital frequency synthesizer having an output terminal for providing a digital local oscillator signal having a frequency chosen to mix a channel to a desired frequency; and a second mixer having a first input terminal for receiving a radio frequency signal, a second input terminal coupled to the output terminal of the second direct digital frequency synthesizer, and an output terminal for providing a second output signal at a desired frequency.

19. (Original) The tuner of claim 18, wherein the first mixer and the second mixer receive a radio frequency signal within the same frequency band.

20. (Original) The tuner of claim 18, wherein the first mixer and the second mixer receive a radio frequency signal in different frequency bands.

21. (Original) The tuner of claim 7, wherein the radio frequency signal represents a television signal.

22. (Original) The tuner of claim 21, further comprising a second mixer having a first input terminal for receiving the radio frequency signal, a second input terminal, and an output

terminal for providing a quadrature signal, wherein the direct digital frequency synthesizer further has a second output terminal coupled to the second input terminal of the second mixer for providing for providing a phase-shifted digital local oscillator signal.

23. (Original) The tuner of claim 22, further comprising an converter circuit configured to convert the output signals from the first and second mixers to a predetermined center frequency.

24. (Original) The tuner of claim 23, further comprising a second direct digital frequency synthesizer having a output coupled to the converter circuit.

25. (Original) The tuner of claim 7, further comprising an oscillator having a clock signal as an output, the mixer being configured to receive the clock signal and the direct digital frequency synthesizer being configured to receive the clock signal through a divider.

26. (Original) The tuner of claim 25, wherein the mixer further comprises an interpolation filter and a modulator coupled to the output of the direct digital frequency synthesizer to generate a digital M-bit signal to a switching network and the mixer further comprises transconductance circuitry configured to output M current signals to the switching network, the switching network being configured to output the output signal at the desired frequency.

27. (Original) The tuner of claim 7, wherein the radio frequency signal represents a radio band signal.

28. (Original) The tuner of claim 27, wherein the radio band signal is an FM radio signal.

29. (Previously presented) A method for tuning a signal comprising the steps of:

generating a digital local oscillator signal using a direct digital frequency synthesizer having a frequency chosen to mix a channel to a desired frequency;

receiving a radio frequency signal; and

mixing the radio frequency signal with the digital local oscillator signal to provide an analog output signal at the desired frequency.

30. (Original) The method of claim 29, wherein the desired frequency of the output signal is at baseband.

31. (Original) The method of claim 29, wherein the radio frequency signal comprises a plurality of channels and wherein the desired frequency of the output signal is less than or equal to three channel widths.

32. (Original) The method of claim 29, wherein the radio frequency signal comprises a plurality of channels and wherein the desired frequency of the output signal is greater than three channel widths.

33. (Original) The method of claim 29, wherein the generating and mixing steps are performed within a single integrated circuit.

34. (Original) The method of claim 29, wherein the mixing step comprises: converting the radio frequency signal to at least one current signal; and mixing the at least one current signal with the output from the direct digital frequency synthesizer.

35. (Original) The method of claim 34, wherein the radio frequency signal, the current signal, and the output signal comprise differential signals.

36. (Original) The method of claim 34, wherein the converting step comprises generating a plurality of current signals using a plurality of transconductor cells.

37. (Original) The method of claim 29, further comprising applying to the direct digital frequency synthesizer a tuning signal corresponding to a desired channel to be tuned.

38. (Original) The method of claim 33, further comprising generating a second digital local oscillator signal having a frequency chosen to mix a channel to a desired frequency, and mixing a radio frequency signal with the second digital local oscillator signal to provide a second output signal at the desired frequency, additional generating and mixing steps are also performed within the single integrated circuit.

39. (Original) The method of claim 38, wherein the first mixer and the second mixer receive a radio frequency signal within the same frequency band.

40. (Original) The method of claim 38, wherein the first mixer and the second mixer receive a radio frequency signal in different frequency bands.

41. (Original) The method of claim 33, wherein the radio frequency signal represents a television signal.

42. (Original) The method of claim 41, wherein the desired frequency of the output signal is at baseband and further comprising converting the output signal from baseband to a predetermined center frequency utilizing a second digital local oscillator signal.

43. (Original) The method of claim 33, further comprising providing a reference clock signal and utilizing the reference clock signal in the generating and mixing steps.

44. (Original) The method of claim 43, wherein the mixing step comprises converting the radio frequency signal to M current signals, generating an M-bit digital signal from the digital local oscillator signal, and mixing the M current signals with the M-bit digital signal to provide the output signal at the desired frequency.

45. (Original) The method of claim 33, wherein the radio frequency signal represents a radio band signal.

46. (Original) The method of claim 45, wherein the radio band signal is an FM radio signal.

REMARKS

In an Advisory Action (mailed March 12, 2007) the final rejection of claims 1-46 was maintained. More specifically, in the Final Office Action: claims 1, 5, 6, and 29 were rejected under 35 U.S.C. § 102(a) as being anticipated by Applicant's admitted prior art (hereinafter "AAPA"); claims 2 and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of U.S. Patent No. 7,016,654 (hereinafter "Bugeja"); claims 3 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of U.S. Patent Application Publication No. 2002/0177423 (hereinafter "Cowley"); claims 4 and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of U.S. Patent No. 6,177,964 (hereinafter "Birleson"); claims 18, 20, 38, and 40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of U.S. Patent No. 4,361,906 (hereinafter "Sakamato") and U.S. Patent Application Publication No. 2005/0239499 (hereinafter "Oosawa"); claims 19 and 39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Sakamoto, Oosawa, and U.S. Patent No. 6,711,149 (hereinafter "Yano"); claims 21, 25, and 41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Sakamoto; claim 42 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Sakamoto and PCT Publication No. WO 97/06604 (hereinafter "Hedstrom"); claim 23 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Hedstrom; claims 34-36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of U.S. Application Publication No. 2003/0083033 (hereinafter "Staszewski"); claims 13, 22, and 37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of U.S. Patent No. 5,251,218 (hereinafter "Stone"); claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Hedstrom and Birleson; claim 43 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of U.S. Patent Application Publication No. 2001/0041532 (hereinafter "Tomasz") and Sakamoto; claim 44 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Sakamoto and Staszewski; claims 7, 27, 28, 33, 45, and 46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Tomasz; and claims 8-12, 14-17, and 26 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Applicant respectfully submits that the rejection of Applicant's independent claims 1 and 29, as being anticipated by the AAPA, is clearly improper as the AAPA fails to disclose all of the elements of Applicant's independent claims.

Applicant respectfully submits that Applicant's Fig. 2 (i.e., the AAPA) does not teach or suggest a mixer that is configured to receive a radio frequency signal and a digital local oscillator signal and provide an analog output signal at a desired frequency in response thereto. As is shown in Applicant's Fig. 2 (and described in Applicant's specification in paragraph [0006]), mixer 86 receives a radio frequency signal (f_{IN}) and an analog local oscillator signal (f_{LO}). That is, while DDFS 82 provides a digital local oscillator signal (LO), a digital-to-analog converter (DAC) 84 is provided to convert the digital local oscillator signal (LO) to the analog local oscillator signal (f_{LO}). For at least this reason, Applicant's independent claim 1 is not anticipated by the AAPA. Applicant respectfully submits that independent claim 29, while of different scope than claim 1, is also allowable for at least the reason that independent claim 1 is allowable. Moreover, with respect to independent claim 19, the AAPA does not teach or suggest mixing a radio frequency signal with a digital local oscillator signal to provide an analog output signal at a desired frequency. Additionally, Applicant submits that claims 2-28 and 30-46 are also allowable for at least the reason that the claims depend upon an allowable claim.

CONCLUSION

Since the rejection rests on clear factual and legal errors, Applicant respectfully requests the withdrawal of the final rejection and the allowance of the present application without the need for a long and costly appeal.

The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

April 18, 2007
Date

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